

- 1 Write down the equation of the line with gradient 3 through the point  $(4, -1)$  in the form  $y - y_1 = m(x - x_1)$ .

[1 mark]

- 5 The line joining  $A(4, -5)$  to  $B(18, k)$  has gradient  $\frac{9}{7}$

Find the exact length of  $AB$

[4 marks]

- 7 Three points  $A$ ,  $B$  and  $C$  have coordinates  $A(8, 17)$ ,  $B(15, 10)$  and  $C(-2, -7)$

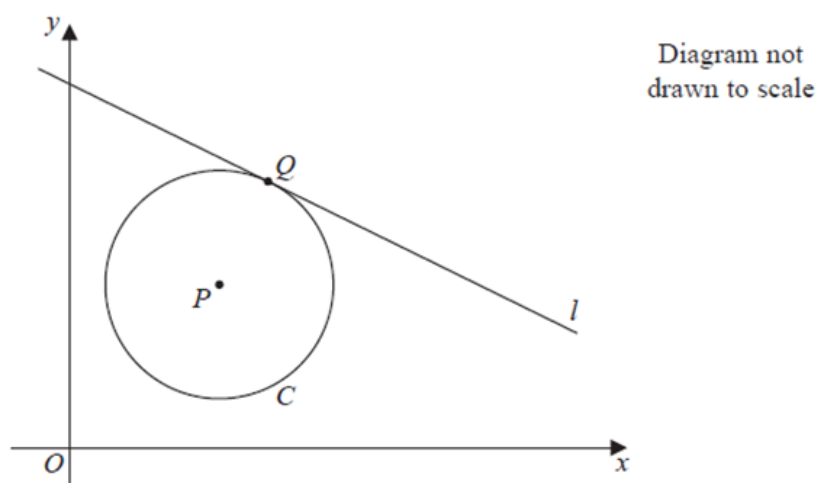
Show that angle  $ABC$  is a right angle.

[3 marks]

- 8 A line has equation  $y = k$ , where  $k$  is a constant. For which values of  $k$  does the line not intersect the circle with equation  $x^2 + 3x + y^2 + 2y - \frac{3}{4} = 0$ .

[4 marks]

8.



**Figure 4**

The circle  $C$  has centre  $P(7, 8)$  and passes through the point  $Q(10, 13)$ , as shown in Figure 4.

- (a) Find the length  $PQ$ , giving your answer as an exact value. (2)

- (b) Hence write down an equation for  $C$ . (2)

The line  $l$  is a tangent to  $C$  at the point  $Q$ , as shown in Figure 4.

- (c) Find an equation for  $l$ , giving your answer in the form  $ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are integers. (4)